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ABSTRACT

The primary purpose of this study was to investigate the influence of participation in adult basic education on changes in selected non-cognitive attributes: anomia, self-concept, and internal-external control of environment. Two subsidiary problems were to examine the differences in levels of anomia, self-concept, and internal-external control of adult basic education participants and a comparable group of non-participants at the time of the pretest and at the time of the post-test; and to examine the relationship of levels of anomia, self-concept, and internal-external control to gain made in academic achievement. Data for the study were obtained from nine selected communities in North Carolina. In these communities, 381 functionally illiterate persons were given the pre- and post-tests, and 180 subjects served as the experimental group and 45 as a control group. Participants showed positive changes in levels of anomia and self-concept; data relating to internal-external control and to level of achievement were considered to be too inconsistent for hypotheses testing. An important point supported in this study was that differences between communities are a major source of variation. (Author/MF)

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THE EFFECT OF ADULT BASIC EDUCATION ON SELECTED NONCOGNITIVE ATTRIBUTES

by

V. Milton Boyce, John K. Coster, and Robert J. Dolan*

Problem

The central problem of this study was to ascertain if participation by the functionally illiterate in an Adult Basic Education (ABE) course elicits significant changes in selected noncognitive attributes.[1] A subsidiary problem was centered on determining if participants in ABE courses differ from nonparticipants on selected variables. More specifically, the study was addressed to two questions:

1. Does participation in ABE courses elicit changes in the level of anomia, self-concept, and internal-external control of the participant?

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[1]This pilot study was carried out as a portion of a more general study consucted as part of the program of the Center for Occupational Education of North Carolina State University at Raleigh. The Center is funded by the U.S. Department of Health, Education, and Welfare, Office of Education, Bureau of Research Division of Comprehensive and Vocational Education Research, Project No. BR-70348, Grant No. OEG 2-7-070348-2698.

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2. Does the ABE participant's level of anomia, self-concept, and internal-external control differ from that of the functionally illiterate who does not participate in the ABE program?

The present study emerged from a composite of studies which revealed that certain noncognitive attributes of the adult learner are associated with participation and achievement in educational activities.[1] For example, Jackson and Strattner (1964, p. 513) stated:

> Learning effectiveness is enhanced by the possession of particular psychological strengths, such as positive attitudes toward school, realistic achievement goals, and feelings of self-confidence.

This conclusion was reached after reviewing the Brookover et al. (1964) study on self-concept and the Seaman and Evans (1962) and Crandall et al. (1962) studies of alienation as examples of meaningdul noncognitive variables in learning situations.

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[1]Noncognitive attributes were defined by Stern (1963, p. 400) as "measures of individual differences in attitudes, values, interests, appreciations, adjustments, temperament, and personality." These attributes are termed "noncognitive to distinguish them from the more consciously organized conceptual schema associated with measures of intelligence, aptitude, achievement, or performance."

Noncognitive Attributes

For the present study, the constructs of self-concept (S-C), internal-external control (I-E), and anomia (E-A) were selected for measurement as noncognitive attributes.[1] This selection in no way implies that there are no cognitive properties in self-concept, internal-external control, and anomia, but that the theoretical cores of these constructs are essentially noncognitive. These noncognitive factors appear to be relevant in working with the functionally illiterate.[2] Attention now is directed to a more detailed

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[1]Self-concept, as used in this study, is the internal frame of reference within which the individual perceives himself as a function of past reinforcement history.

Internal-external control, as used in this study, refers to the degree to which individuals believe that the occurrence of reinforcement is contingent upon their own behavior. Internal control is defined as the perception of one's own actions and thereby under personal control, whereas external control is defined as the perception of positive and/or negative events as being unrelated to one's own behavior, and, therefore, beyond personal control (Peters, 1968).

Anomia, as used in this study, is defined as the socio-psychological state of the individual who suffers with a feeling of despair presumably resulting from normlessness (Lewis, 1966). "Eunomia" and "anomia" refer to a continuum of this variable, with the former denoting a well-ordered condition and the latter, a state of normlessness.

[2]Functionally illiterate, as used in this study, is defined as any person 18 years of age or older who has not completed eight years of formal education or who has not retained an educational equivalent of this level and who is unable to function effectively in a modern civilization (Ramsey, 1966).

examination of the three constructs selected for the present study.

Self-concept

The first noncognitive attribute to be considered is self-concept. Kaplan reviewed the literature on self-concept and reported that most of the studies supported the view that self-concept has much to do with one's social success or failure. Kaplan (1965, p. 137) maintained that:

> The person who has a low concept of himself avoids people, or displays such competitive, defensive, or dependent characteristics that people are repelled, thus depriving him of sustaining human relationships.

Klausner (1953) and Hawk (1967) concluded that self-concept is more homogeneous among members of the same socio-economic status group, with the disadvantaged having had less rewards associated with academic behavior, which suggests a lower self-concept. This concept was supported by Carroll (1945) and Battle and Rotter (1963), who found the self-concepts of disadvantaged youth to be characterized by low self-esteem, self-deflation, and self-depreciation.

Internal-external Control

The second noncognitive attribute, internal-external control, was treated in research by Seeman and Evans (1962),

Seeman (1963, 1966), Rotter (1966), Davis and Phares (1967), and Peters (1968). The findings of these studies consistently indicated that adults with strong feelings of powerlessness (I-E) fail to learn information necessary to control their environment and to receive reinforcement. A central hypothesis supported in Peters' (1968) study was that participants in occupational education are expected to be more internally oriented than those who do not participate. He concluded that among the antecedents of expectancies of external control are lack of education and unemployment. Hence, it seems reasonable to assume that participation in a program that results in raising the educational level with a concomitant increase in employability should help the individual to view his environment as more amenable to his personal control.

Anomia

The third of the three selected noncognitive attributes is anomia. Like self-concept and internal-external control, this factor also appears to be related to learning and employment opportunities. Analysis of the Southern Regional Cooperative Research Project data by Boyd and Morgan (1966) revealed that persons who are better adjusted occupationally are less likely to be anomic than persons who are less well

adjusted occupationally. Those who are lowest in anomia also are more willing to borrow money to improve their current employment status.

From their study of anomia and access to the achievement of life goals of 701 male respondents, Meier and Bell (1959) concluded that socio-economic status, class identification, age, social isolation, and occupational mobility are all related to the variable anomia. Their findings showed that the respondents of low socio-economic status not only are lacking in education, capital, and occupational training, but feel their life goals are impossible to achieve.

Theoretical Consideration

The systematic framework for this study was derived from an analysis of the research reported in related literature and was based on socialization, social interaction, and social learning theories. The underlying orientation providing the linkage of the three theories with the three selected constructs is reinforcement theory.

The nature of an adult's adjustment to a new social environment (socialization) depends on whether or not the significant figure recognizes the relevant reinforcing stimuli for his behavior and provides them appropriately;

and whether or not the adult, through social learning, acquires responses appropriate to that setting (Goslin, 1969). The crux of the issue is to suggest a rapprochement among socialization, social interaction, social learning, and reinforcement.

Adults are subjected to socialization processes (reinforcement process) as they move from one social situation to another. Elder (1968, p. 354) defined socialization as "the transmission of cultural traditions, new knowledge and values, the development of skills, and the utilization of training techniques to ensure appropriate learning." As the adult proceeds through adulthood, he must continuously learn to play new or altered roles and to relinquish old ones. The individual's self-concept, internal-external control, and anomia characteristics emerge from the process of socialization.

Lindersmith and Strauss (1968) said that the frames of reference the individual uses to evaluate himself and others are derived from his interaction within certain groups. Without group interaction and group commitment, the individual becomes alienated. Thus (Goslin, 1969, p. 19), "it is obvious that effective socialization is impossible under conditions where the individual is isolated from the system

into which he is being socialized." Accordingly, it may be postulated that ease of socialization is directly related to rate of interaction among participants in the system, because it provides more opportunities for appropriate reinforcement.

Rotter (1966), in discussing social learning theory, contended that an individual's behavioral choices are contingent upon the expected reinforcement and the degree to which the individual feels the reinforcement is controlled by forces outside of himself. If the individual perceives that reinforcement is contingent upon his own behavior, this belief is termed internal control. Conversely, if the individual perceives that reinforcement is a result of luck, chance, fate, or is under the control of powerful others, then this belief is labeled external control. Failure of reinforcement thus can be considered an antecedent of externality. If there is continuous nonreinforcement, the feeling of lack of control of the environment (externality) may regress to anomia.

The ideal ABE class is structured to provide additional successes of positive reinforcements and, theoretically, by its very nature, should positively change the self-concepts, internality and eunomia, of the participating

adults. Stated another way, just as a person's noncognitive attributes might affect his success as a learner, so might recurrent successes or failures in ABE serve to alter his noncognitive qualities.

Methodology

Nine North Carolina community colleges and/or technical institutes were selected as the sources of respondents. These nine institutions were selected in cooperation with the director of Continuing and Adult Basic Education in the N. C. Department of Community Colleges and were selected to reach diverse community characteristics such as rural and urban and geographic location within the state. Potential interest in the institution in cooperating in the study was considered in selecting the institutions. Thus the community factor was a fixed factor and any generalization of interest is restricted to the 9 levels of the community factor.

Resources available to conduct the ABE classes in these selected institutions were adequate to staff three classes of ABE in each institution. Each institution approved for offering the ABE program and selected for the experiment was requested to organize three new classes of ABE with approximately 10 students in each class. The directors of ABE in

each of the nine institutions were requested to select a sample of approximately 10 nonparticipants from a population as similar to the demographic characteristics to the participants as possible. Thus there was to have been 30 individuals in the experimental group and 10 individuals in the control group within each of the nine communities.

The treatment for the experimental group was a regular ABE literacy training program currently being offered at each institution. This program includes the teaching of reading, writing and arithmetic. The control group was to receive no training. Both groups were given the pretest and after the ABE participants had completed 60 hours of literate instruction, both groups were given the posttest.

Measurement of Variables

The Tennessee Self-Concept Scale (TSCS) developed by Fitts (1965) was selected to measure the noncognitive variable self-concept. The scale consists of 100 self-descriptive statements which the subject uses to portray his own concept of himself.

The Total P (TP) score is the largest of the subscales, and is a measure of overall self-concept. Fitts (1965, p. 2) stated:

> This is the most important single score on the Counseling Form...Persons with high scores tend to like themselves, feel that they are persons of value and worth, have confidence in themselves, and act accordingly.

A normal self-concept score falls within specified limits, for the Total P, between 316.7 and 422.0.

The second noncognitive variable, internal-external control of reinforcement, was measureably Rotter's (1966) I-E Scale, which consists of 23 items concerning the nature of the individual's environment. Each scale item contains two statements, and the subject responds by marking the statement in each item which he believes is most often true, or his expectation about how reinforcement is controlled. The score range is from zero to 23, with the lower score indicating internality and the higher score indicating externality.

The third noncognitive variable, anomia, was measured by the Moon-McCann Modification of the Srole Anomia Scale (Moon and McCann, 1965), which consists of six items, with a score range of zero to 6. High scores indicate high anomic behavior and low scores indicate normal behavior.

Research Design

The study was designed as a split-plot design with communities acting as a whole plot with the treatment actioning

as a split-plot. The subjects were nested in the community and treatment cells and two repeated measures were obtained on each subject.

The community factor was at nine levels--C_1, C_2 ... C_9--with each of the areas served by the selected institutions representing a single level. The treatment factor was at two levels--nonparticipants (T_1) and participants (T_2)--and two measures--pretest (P_1) and posttest (P_2)--was taken on each subject.

Analysis of Data

Under ideal conditions a random sample of subjects from the population of low literate adults in each community would have been drawn and the sample randomly assigned to the two levels of treatment. Under somewhat less ideal conditions all of the low literate adults in the community who desired training would have been identified and the population divided randomly into those who were to receive training immediately during the course of the experiment and those whose training would be delayed until after the data had been collected for the experiment. Pre and post measures would have been obtained for both the subjects who were treated and the subjects whose training was deferred, and therefore, who were serving as the control

group.

These ideal conditions could not be met satisfactorily for two reasons. In the first place, the subjects who desired to be trained, desired immediate training and would not have cooperated with a program that featured delayed gratification. In the second place, the allocation of resources was such that the training had to be provided during the period of the study. Consequently, an alternate plan was used which, although less desirable, was expected to yield data which could be used in the examination of the effects of training. This plan provided for all persons who desired training to be trained and it also provided for the selection of a random sample of nontrainees from the population of potential trainees to be used as the control group. Actually, therefore, the trainees were self-selected and the self-selection process determined the treatment implication. In that the subjects were not assigned randomly to the treatments, the plans of experimental design were violated and any interpretation of the data made must of necessity take into account this violation. It was assumed, however, that the dependent variable was normally and independently distributed in the population and that the variances within the cells were homogeneous.

In order to obtain an index of the magnitude of the differences between means of interest, the data were treated as though the assumption underlying the application of the analysis of variance and the plans of experimental design had been met. The design provides for the analysis of the data by the analysis of the variance. The test statistic was the F statistic and the critical region selected for this study was the theoretic value of F at the .10 level of significance. The keyout of the analysis of variance, the indicated tests, and the critical regions are listed below.

Source of variance	df	Critical region
Community (C)	8	
Error a	0	
Treatment (T)	1	$F_{.90}(1,207) = 2.73$
CT	8	$F_{.90}(8,207) = 1.70$
Error b	207	
Pretest vs. posttest (P)	1	$F_{.90}(1,207) = 2.73$
CP	8	$F_{.90}(8,207) = 1.70$
TP	1	$F_{.90}(1,207) = 2.73$
CTP	8	$F_{.90}(8,207) = 1.70$
Error c	207	
Total	449	

In order to examine the magnitude of the difference

between means of interest, the design provided for the sum of squares for treatment, pretest vs. posttest in the interaction of treatment by pretest versus posttest to be summed and repartitioned according to selected orthogonal comparisons. These orthogonal comparisons were selected to enable the experimenter to answer the two major research questions.

The first question dealt with whether the mean scores of the participants changed from the pretest to the posttest and whether the mean scores of nonparticipants changed from the pretest to the posttest. To obtain the answer to this question, the three sums of squares for treatment, pretest versus posttest and the interaction of treatment by pretest versus posttest was pooled and subdivided according to treatment combinations with contrasts defined as follows:

	T_1P_1	T_2P_1	T_1P_2	T_2P_2
C_1	-1		+1	
C_2		-1		+1
C_3	-1	+1	-1	+1

Comparison C_1 provides information to answer the question as to whether the control groups noncognitive scores changed from the pretest to the posttest. Comparison C_2 provides information to indicate whether the trained group changed its noncognitive scores from the pretest to the

posttest and comparison C_3 simply gives the sum of squares for treatment averaged over the two levels of pretest versus posttest.

The second question was directed to examination of the differences between the mean scores of the participants and nonparticipants in the beginning of the experiment and at the end of the experiment on scores of self-concept and anomia. To obtain an answer to this question the sum of the three sums of squares were repositioned according to the following three contrasts:

	$\underline{T_1P_1}$	$\underline{T_2P_1}$	$\underline{T_1P_2}$	$\underline{T_2P_2}$
C_1	-1	+1		
C_2			-1	+1
C_3	-1	-1	+1	+1

Comparison C_1 provides information as to the difference between the subjects who were trained and the control sample at the beginning of the experiment. Comparison C_2 provides information of the difference between the subjects who were trained and the control sample at the end of the experiment. The third contrast is the main effect for the difference between the pretest scores and the posttest scores averaged over the two levels of treatment.

Because of the difficulty of analyzing the data according to the layout of the design, the 321 persons for whom

pre and posttest data were available was reduced by sampling to 20 ABE participants and 5 nonparticipants within each community. Thus the analysis is based on a total of 180 individuals in the trained level of the treatment and 45 persons in the control level of the treatment. The data were analyzed between analyses of variance and the contrasts specified above were run on the data.

In analyzing the data, the questions posed above were treated as though they were null hypothesized. The interest was in determining whether the differences between scores was relatively large and the most appropriate index on magnitude was to compare the difference between means or the action component with its appropriate experimental error.

Results

In this study, interest was centered on (1) improvement or change in levels of self-concept and anomia of the functionally illiterate as a result of participating in ABE programs and (2) possible differences between participants and nonparticipants at the time of the pretest and the time of the posttest. Hence, major interest was directed toward an examination of the effect of treatment at two levels and the difference between the pretest and posttest scores.

Communities were introduced as a factor in the design (1) to remove differences between communities as a source of random variations in the experimental error terms, thus increasing the precision of the tests of significance, and (2) to ascertain any interaction between communities and treatment or between communities and pretest versus posttest scores.

Self-concept

The results of the analysis of variance of self-concept scores for the split-plot design are summarized in Table 1. Significant interaction effects were found for CP and TCP. These interactions were not anticipated in the design of the study. The means of communities by treatments and the

Table 1. Analysis of variance of self-concept scores

Source of variation	df	SS	MS	F-ratio
Community (C)	8	37259.20	4657.40	
Error a	0			
Treatment (T)	1	458.04	458.04	0.27
CT	8	11383.74	1422.97	0.83
Error b	207	354099.70	1710.63	
Pretest & posttest (P)	1	564.48	564.48	1.28
CP	8	6577.04	822.13	1.87[a]
TP	1	904.54	904.54	2.05
TCP	8	6395.84	799.48	1.82[a]
Error c	207	91141.10	440.30	
Total	449	508783.68		

[a] $F_{.90}(8,207) = 1.70$

means of communities by pretest versus posttest scores were plotted to ascertain if the interaction effects might be removed or reduced by monotonic transformation.

The graphic criterion for ordinal interaction--*i.e.*, interaction that can sometimes be reduced or removed--was not met. Thus, the interaction is disordinal, and any change in self-concept cannot be assumed to be attributable to the treatment independent of community and pretest-posttest.

The presence of interaction limits the interpretation of main effects. Despite the knowledge of this limitation, the orthogonal comparisons specified in the earlier discussion of methodology were computed and are reported herein. The results are shown graphically in Figure 1.

For each interpretation, the hypotheses specified earlier are restated as questions. Table 2 shows the results of the test of significance designed to answer the questions:

1. Did the self-concept mean scores of the nonparticipants (T_1) change from the pretest (P_1) to the posttest (P_2), *i.e.*, T_1P_1 versus T_1P_2?
2. Did the self-concept mean scores of the participants (T_2) change from the pretest (P_1) to the

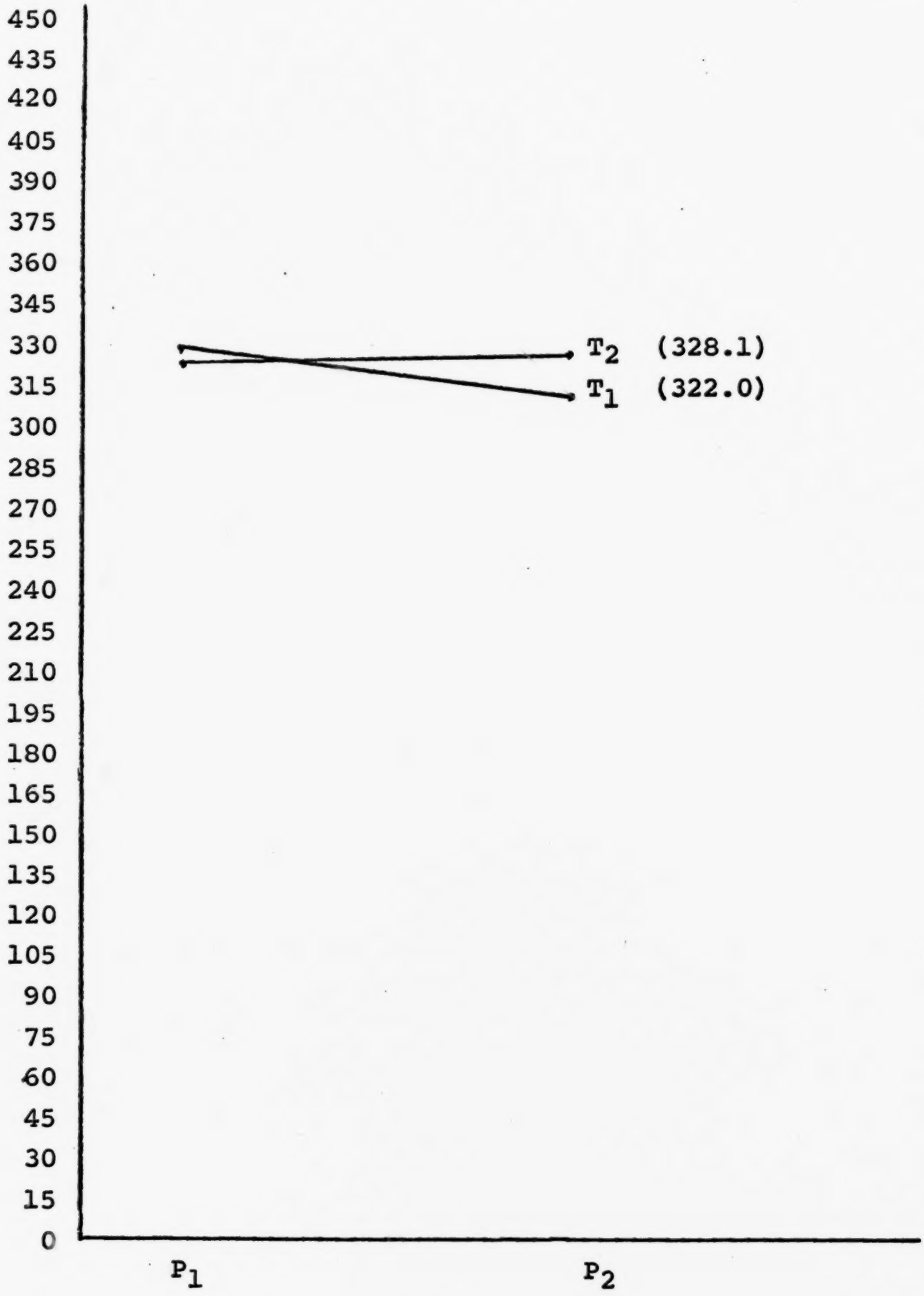

Figure 1. Self-concept pretest (P_1) and posttest (P_2) mean scores across communities for nonparticipants (T_1) and participants (T_2)

posttest (P2), i.e., T_2P_1 versus T_2P_2?

(The third contrast shown in Table 2 is of no immediate interest).

A significant negative change in self-concept was found for the nonparticipants, but no significant change was found for the participants. Therefore, null hypothesis H_{o1a}: $T_1P_1 = T_1P_2$ was rejected and null hypothesis H_{o1b}: $T_2P_1 = T_2P_2$ was not rejected.

Table 2. Summary of orthogonal comparison sums of squares of simple effects of pretest and posttest and main effects of treatment--self-concept

Source of variance	df	MS	F-ratio
C_1, T_1P_1 versus T_1P_2	1	1408.18	3.20[a]
C_2, T_2P_1 versus T_2P_2	1	60.84	.14
C_3, T_1 versus T_2	1	458.04	
Error	207	440.30	

[a] $F_{.90}(1,207) = 2.73$.

The data in Table 3 answer two additional questions that were defined as null hypotheses:

1. Is there a difference between the self-concept mean scores of the nonparticipants (T_1) and participants (T_2) at the time of the pretest (P_1)?
2. Is there a difference between the self-concept mean scores of the nonparticipants (T_1) and the participants (T_2) at the time of the posttest (P_2)?

(There is no immediate interest in the third contrast).

The data in Figure 1 and Table 3 show that the answer to the first question is "no," but the answer to the second question is "yes." Actually, however, the change occurred due to a reduction in the mean self-concept scores of the nonparticipants and not to an increase in the self-concept scores of the participants. The mean scores of the participants remained unchanged from the pretest to the posttest. Therefore, H_{o2a}: $T_1P_1 = T_1P_2$ was not rejected and H_{o2b}: $T_1P_2 = T_2P_2$ was rejected.

Table 3. Summary of orthogonal comparison sums of squares of simple effects treatment 1 and treatment 2 and main effects of pretest-posttest--self-concept

Source of variance	df	MS	F-ratio
C_1, T_1P_1 vs. T_2P_1	1	37.61	.08
C_2, T_1P_2 vs. T_2P_2	1	1324.96	3.01[a]
C_3, P_1 vs. P_2	1	564.48	
Error	207	440.30	

[a] $F_{.90}(1,207) = 2.73$.

Anomia

The presence of interaction again limited the interpretation of main effects. The analysis of variance of anomia scores is summarized in Table 4 for the split-plot design. The specified orthogonal comparisons were computed

and are illustrated graphically in Figure 2.

The research questions of interest were:

1. Did the anomia scores of the nonparticipants (T_1) change from the pretest (P_1) to the posttest (P_2), i.e., T_1P_1 versus T_1P_2?
2. Did the anomia scores of participants (T_2) change from pretest (P_1) to the posttest (P_2), i.e., T_2P_1 versus T_2P_2?

Table 4. Analysis of variance of anomia scores

Source of variance	df	SS		F-ratio
Community (C)	8	109.72	13.72	
Error a	0			
Treatment (T)	1	9.25	9.25	3.00[a]
CT	8	31.62	3.95	1.28
Error b	207	638.18	3.08	
Pretest & posttest (P)	1	5.56	5.56	4.68[a]
CP	8	28.36	3.55	2.99[b]
TP	1	6.13	6.13	5.16[a]
TCP	8	18.08	2.26	1.90[b]
Error c	207	245.88	1.19	
Total	449	1092.78		

[a] $F_{.90}(1,207) = 2.73$.

[b] $F_{.90}(8,207) = 1.70$.

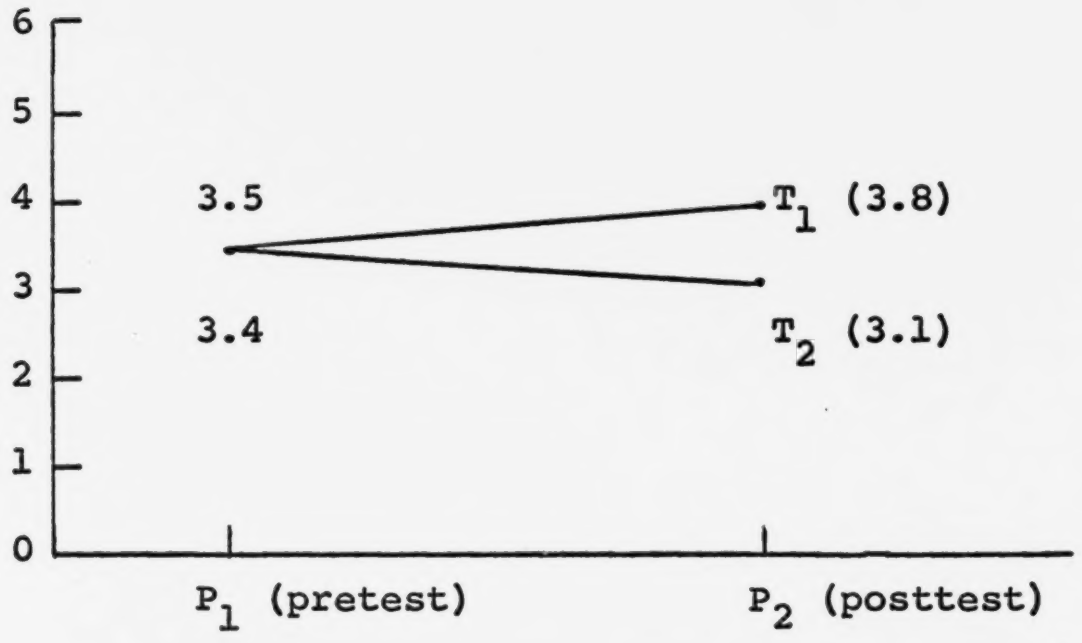

Figure 2. Anomia pretest (P_1) and posttest (P_2) mean scores across communities for nonparticipants (T_1) and participants (T_2)

The data in Figure 2 and Table 5 show that the answer to the first question is "no," but the answer to the second question is "yes." The participants at the time of the posttest had a lower anomia score than at the time of the pretest. Therefore, H_{o1a}: $T_1P_1 = T_1P_2$ was not rejected and H_{o1b}: $T_2P_1 = T_2P_2$ was rejected.

Table 5. Summary of orthogonal comparison sums of squares of simple effects of pretest and posttest and main effects of treatment--anomia

Source of variance	df	MS	F-ratio
C_1, T_1P_1 vs. T_1P_2	1	1.34	1.20
C_2, T_2P_1 vs. T_2P_2	1	10.34	9.25[a]
C_3, T_1 vs. T_2	1	9.23	
Error	207	1.19	

[a] $F_{.90}(1,207) = 2.73$.

The second set of relevant research questions relating to the variable anomia ask:

1. Is there a difference between the anomia mean scores of nonparticipants (T_1) and participants (T_2) at the time of the pretest (P_1)?
2. Is there a difference between anomia mean scores of the nonparticipants (T_1) and participants (T_2) at the time of the posttest (P_2)?

The data in Figure 2 and Table 6 show the answers to these questions. The answer to question 1 is "no" and the answer to question 2 is "yes." The difference at the time of posttest is due to a positive change in participants' anomia scores. Therefore, H_{o2a}: $T_1P_1 = T_2P_1$ was not rejected and H_{o2b}: $T_1P_2 = T_2P_2$ was rejected.

Table 6. Summary of orthogonal comparison sums of squares of simple effects treatment 1 and treatment 2 and main effects of pretest-posttest--anomia

Source of variance	df	MS	F-ratio
C_1, T_1P_1 vs. T_2P_1	1	.16	.13
C_2, T_1P_2 vs. T_2P_2	1	15.21	13.60[a]
C_3, P_1 vs. P_2	1	5.56	
Error	207	1.19	

[a] $F_{.90}(1,207) = 2.73$.

Internal-external Control

When subjected to factor analysis, the third noncognitive scale (Rotter I-E Scale) showed seven factors accounting for 50 percent of the total scale variance. Thus, the measure of reliability of the factor analysis was performed by the split-sample technique (Armstrong and Soelberg, 1968). The factor analysis of the first sample resulted in the extraction of eight factors and the factor analysis of the second sample resulted in the extraction of nine factors. A comparison of the three factor analyses showed that no one factor on any of the three separate analyses contains similar items.

The results of the factor analysis of the I-E scale and the relatively low reliability of .517 call into question the construct validity and the reliability of this

measurement for this particular ABE population. The subjects' responses were not consistent and appeared to be random in nature. Due to the failure to obtain support of validity or reliability for the I-E scale, the tests of the null hypotheses concerning this variable are not reported.

Discussion

The subjects were not randomly selected or randomly assigned to treatment groups; therefore, the results of the tests of significance are to be interpreted as an index of magnitude, and not as an estimate of a parameter or as a "real" test of hypotheses. Further, since "community" is a fixed factor, any possible generalization is restricted to the population of nine communities included in the study.

The study was designed to determine if there were an interaction between communities and treatment and communities and pretest versus posttest scores; however, the second-order interaction was totally unanticipated and is somewhat unusual. Although significant at the 10 percent level, the interaction is not large. Nevertheless, according to accepted research design procedures, the interaction must be recognized in that it falls in the critical region

set on an a priori basis for the study. In fact, the most reliable interpretation that can be made is at the community level, which was tested for linear effects of T and of P for each level of C; but is not reported in this paper.

The analysis of the related literature would lead to the expectation that the self-concept scores of the target population would fall below the established "normal" range. The established normal profile limits for the "Total P" self-concept score are 316.67 (lower limits) and 422.00 (upper limits). The mean score for the population in the present study was 327.97, so the expectation was not supported. The lowering of nonparticipant scores is not readily explainable; a plausible explanation is that the change is an artifact of the test, and not evidence of an ongoing phenomenon.

The combination of community, pretest-posttest, and treatment had significant effects on anomia scores. There was a significant difference in anomia scores of nonparticipants and participants at the posttest level and a significant change in participants' scores from pretest to posttest (3.47 at pretest to 3.13 at posttest). The lower anomia score is in a positive direction for this attribute. The interpretation of the changes in means is a matter of conjecture. The results of the tests, however, lend

credence to a theory that successful participation is associated with less anomic behavior. Presumably, the conclusion relating to anomia supports the theoretical framework developed in this study.

Implications and Recommendations

Three types of implications and recommendations can be drawn from this study:

1. Implications concerning research methodology.
2. Implications for ABE and related research.
3. Implications for occupational education and related research.

These implications and recommendations are presented in the sections that follow.

Research Methodology

Many educational experiments mask over the effect of communities, schools, or classes, thus running the rish that the experimental error term may be inflated due to the presence of a source of variation that should be removed from the error term. Further, the possibility of a community by Treatment interaction is real, and this possibility should be provided for in the design. In this study, the precision of the study actually was not increased significantly by blocking on Communities, and treating this factor

as the whole plot factor. But an interaction effect was observed. The presence of the interaction effect tends to invalidate the interpretation of main effects. The results of this study augurs for the designs in which the source of variation for communities and interaction of communities by treatments may be removed from experimental error variance, and the possibility of interaction effects detected.

The second research implication is that there is a need for a preliminary study before launching a longitudinal project. The findings of the present study provided a check of certain statistical procedures, the feasibility of the research design, and the desirability of particular research measures.

Adult Basic Education

The findings of this study should contribute to the growing body of knowledge existing in the field of adult education relating to ABE. Utilizing reinforcement theory, this study dealt with the noncognitive behavioral changes of the ABE student rather than the traditional cognitive or psychomotor behavior changes.

A theoretical implication for ABE is that reinforcement provided in certain ABE learning situations can bring about changes in the student's level of anomia. Thus,

anomia is not a fully structural product of past reinforcement--it can be changed.

Similarly, if self-concept is a key factor in role performance, a practical implication of this study is that the level of self-concept of the functionally illiterate is not a limiting factor in his life chances. The total mean self-concept scores for participants, with the exception of one community, were within the specified normal profile limits.

The length of classroom exposure used in this study--a session of approximately 60 to 70 hours--may not be sufficient when measuring the noncognitive changes taking place as a result of ABE participation. The positive changes indicated by difference in pretest and posttest mean scores could support this assumption. Over a longer period of time, more pronounced changes might be observed.

An implication for the testing of ABE students is evident in the findings of this study. The item construction of measuring instruments is basic for obtaining valid information. Thus, questions to obtain information from ABE students should be so structured that their length is within the attention span of the students involved.

Occupational Education

The fact that the level of anomia of ABE students can

be changed through participation in certain ABE programs is sufficient to justify further research for use of an anomia scale as a tool for the ABE guidance counselor. Since previous research evinces that anomia level is related to the individual's level of living, participation in special educational programs, willingness to move, and adjustment to occupations, the student's level of anomia should provide the counselor with an indicator of readiness for change and acceptance of new societal demands, e.g., occupational training.

A mathematical self-concept model could be developed by comparing ABE student profiles, Total P, and subscores from eight subscales with persons already successful in various occupations. The model then could be used in matching the individual's self-concept profile with job requirements; e.g., the ABE student who has a high physical self-concept subscore may receive more reinforcement in active work, while a student who has a high social self-concept may receive more reinforcement in selling or social type work.

This study involved only a small, select segment of the functionally illiterate population in North Carolina. The researcher suggests that additional empirical studies

be conducted to verify more fully the preceding implications and recommendations.

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